

COLOUR Green

Colouring the Urban Habitat Green

A Handbook for growing trees in urban areas

CEE



Developed and designed by
Centre for Environment Education, Southern Regional Cell
Bangalore 560 001

Under
Integrated Urban Environment Improvement Project of the
Bangalore Development Authority Implemented by CEE

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First Edition with 32 plates in colour

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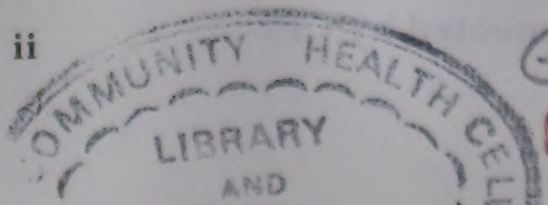
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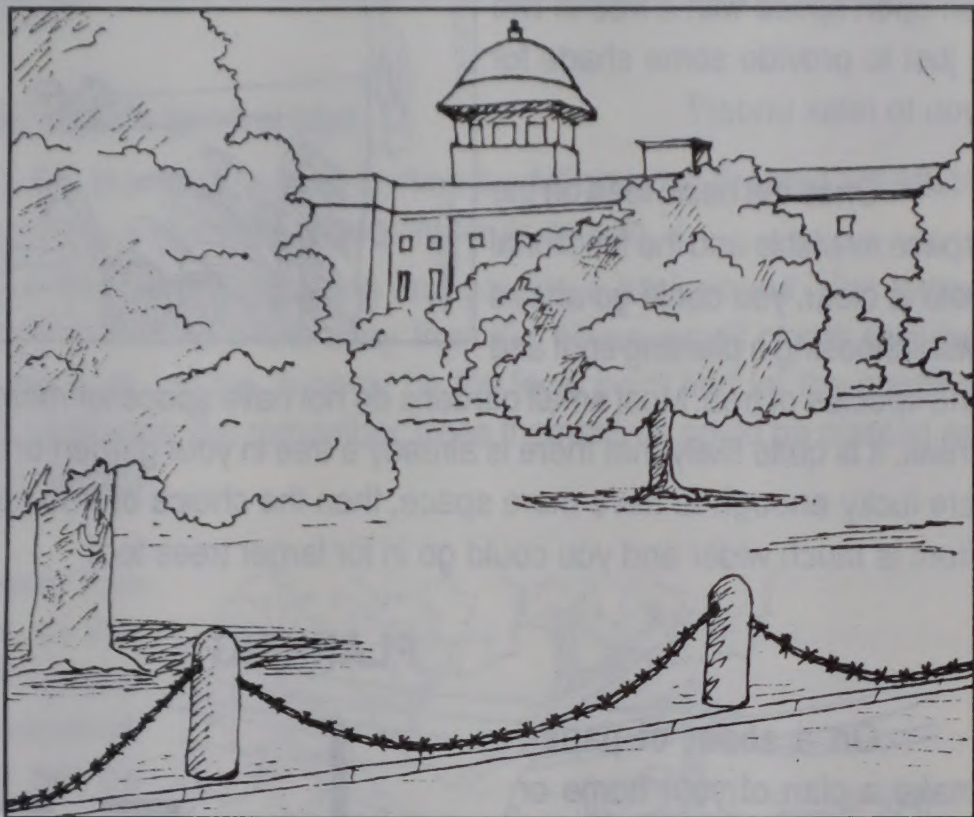
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...AND GIVE ME SOME MORE COLOUR GREEN

In the hustle and bustle of our daily lives, we rarely find the time to stand and admire the beauty of a tree in bloom. Trees themselves are fast becoming a rare feature in the concrete skyline of urban and sub-urban areas. They are often the first to be sacrificed at the altar of urbanisation. Housing, roads and infrastructure are given greater priority than the conservation of vegetation in our cities and towns.



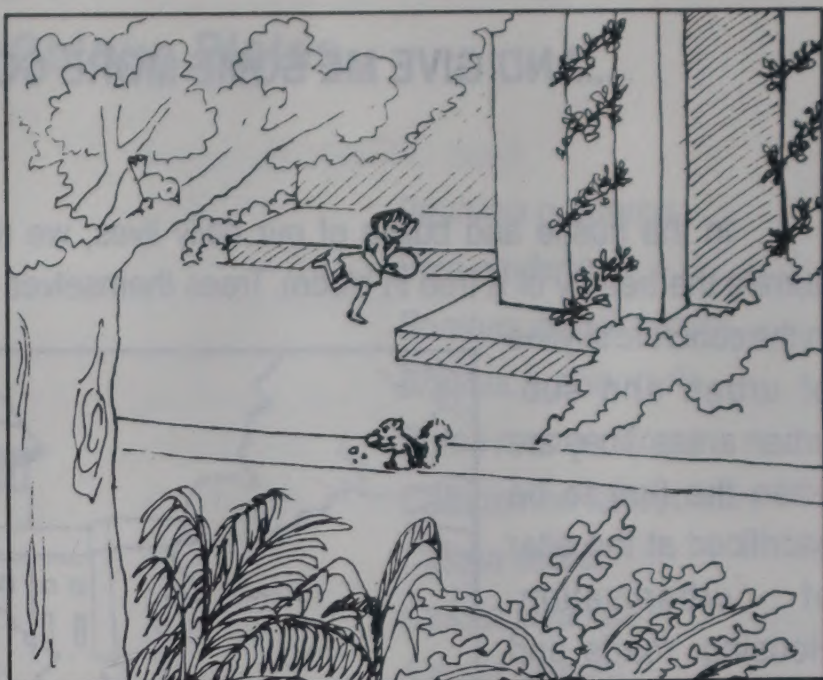
Yet trees and gardens provide a respite to many of us who are weighed down by the pressures of modern day lifestyles. Trees afford shelter and shade and make the summer heat bearable. Many are ornamental, beautiful in bloom, in outline or foliage. Some trees fill the air with the delicious fragrance of their flowers. Almost all of them delight and refresh the eye with their restful green foliage. Trees are also known to absorb noise. Besides, they are home to many varieties of birds and insects that would otherwise have no place in the unnatural eco-system of urban areas.

This book is a guide for tree lovers. It helps in planning for growing of trees and shrubs in towns and cities, along roads, in public parks as well as domestic gardens.

GETTING STARTED IN YOUR GARDEN

Planting a tree or a shrub is not difficult at all. However, we need to understand that planting a tree today makes the surroundings beautiful a few years later. In selecting the tree species, space available and the functional role of the tree should be the main considerations besides shade and aesthetics.

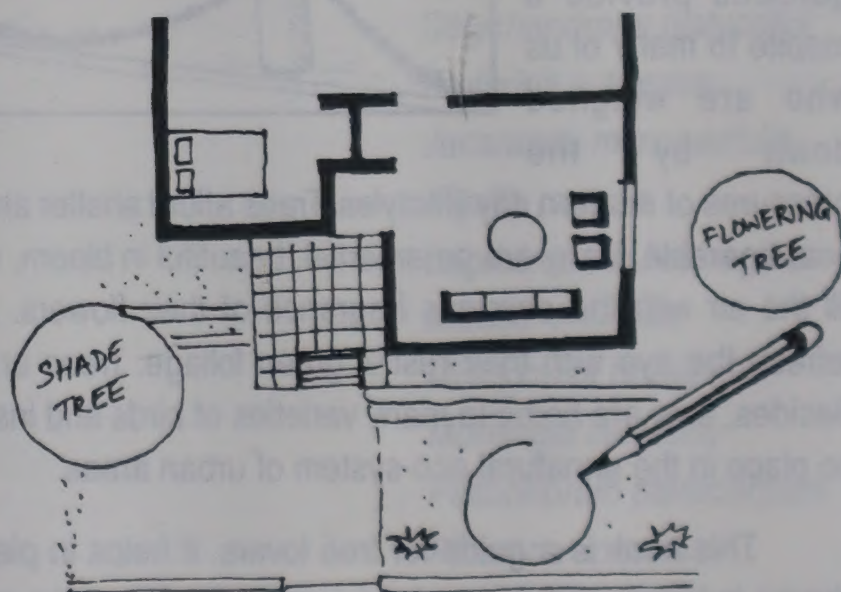
Do you want a nice looking garden that enhances the looks and appearance of your house? Or one which is fully enclosed and private? Do you require a kitchen garden? Or do you need an open space with a tree or two - just to provide some shade for you to relax under?



Once the basic idea on the space available and the functional role is clear, you could go ahead with choosing a planting spot and the species of tree. Most small gardens do not have space for more than a couple of small trees. It is quite likely that there is already a tree in your garden or on your roadside. If you are lucky enough to have more space, then the choice of tree species you could select from is much wider and you could go in for larger trees too!

PLANNING

On a sheet of paper, make a plan of your home or school (any educational institution or a large campus can also plan similarly) with the space available for the garden. Draw the positions of the house, doors, windows, the walkway, the driveway, the gate, the shed and the canopy of the existing trees and plants that cannot be moved. You could do this on graph paper to help you with scales and proportions or use a tracing sheet over an existing house plan.



Use paper disks equivalent in scale to a diameter of three meters for a small tree and six meters for a medium sized tree and at least nine metres for a larger tree. Move these over your plan or tracing. Place it in different locations and see how it fits in between the existing vegetation and the building. The centre of the disk could approximately

represent the planting spot. Check that you have the necessary space for the tree you are considering planting.

When developing a plan, there is no need to name the tree species right at the beginning. Classifying them as shade trees, flowering trees, shrubs, hedges, flowerbeds etc. is adequate. However an idea of the desired sizes of trees and shrubs would be essential. Specific tree species could be identified at a later stage once the general plan is clear.

Guidelines to help you make a general plan

- Do not over plant. It is important to keep in mind the full size that the tree will attain when mature and the space that it will require for its growth.
- Use trees to frame the house or building and provide a background. Use larger shrubs and trees at the corners and away from the house, small plants may be planted towards the door. Let the doorway be the focal point and let the planting lead the eye to the entrance. But remember, trees themselves could be planted as a focal point in larger gardens.
- Plant trees well away from drains and pipes, so that in the event that they have to be dug-up or repaired, the trees need not be removed.
- Similarly, do not plant large or tall trees under electric wires. If there is not enough space for a tree, plant a shrub.
- Plant all trees at least a metre away from the compound wall and about three metres away from the house or building. If you have space enough for a large tree, this distance has to be proportionately greater! Generally, a distance equivalent to the height of the tree when mature should be left between the tree and the house.
- While planting trees on roadsides or as avenue trees care should be taken to give enough space between two trees.



SELECTING TREES AND SHRUBS

A tree is a permanent feature. It cannot be moved about like a plant in a pot. Much care and thinking is therefore required in choosing and growing trees in our gardens. You

would have to choose the tree species depending on whether you want the tree to provide shade, some shade with flowers or a spectacular bloom and blaze of colour.

Two of the requirements for planting trees are space and sunlight. You should not even attempt to grow a fast growing large tree when you do not have the space for it. Second would be the sunlight. If the place that you have chosen is shaded or damp throughout the year, species which bloom when they are leafless (Table 1), would not even perhaps come into flower. In such a situation, you should choose species with attractive flowers borne on a green background (Table 2). Or if you prefer neither, choose trees and shrubs used for shade and foliage (Table 3). Common shrubs and herbs, rockery plants and a few climbers can also be chosen (Table 5).

Flowering seasons vary. Some trees stay in bloom for a greater part of the year, whereas some blossom for just a week or two. Knowing the flowering season would be important when planning your garden or when planning to plant trees for your avenue. You would perhaps want to choose trees that bloom at different times of the year. This is done so that your garden would attain a different hue each season or your road would be bordered with different colours at different parts of the year. It must be kept in mind, however, that some trees are slow growing and could take any time between five to ten years to have their first good bloom.



Tree shapes vary. Trees planted in the open usually tend to have a broader crown than those planted in groups or narrow spaces these tend to grow tall. Again tree growth



is also variable. Trees growing in good condition with adequate water and nutrition grow well. Therefore it always pays to take care of your growing tree!!

Selecting the variety or species of shrub or tree is essentially a matter of personal choice. Listed in the tables is some essential information. Also appended are pictures of the more attractive species of trees that you could start your garden with. The list of references would lead you to more information on the subject.

HOW TO USE THE TABLES

The tables group the tree species into three broad categories.

Table 1: Species that bloom when leafless,

Table 2: Trees with showy flowers borne when in leaf

Table 3: Shade trees suited for Avenue Planting.



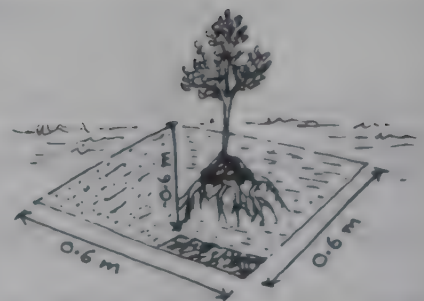
Here is a list that will help you select the tree species for your garden.

- * Choose the category of tree that you want to plant
- * Select the appropriate size category (column 3).
- * Short list the kind of foliage you would like to have: whether coarse or fine, small leaved or large leaved (column 6).
- * Make a choice on the colour or period of bloom (column 5 & 4)
- * Get back to the beginning if you are not able to make a choice. Try to make the best compromise between what you are looking for and what is possible.
- * It always helps to seek good advice, especially since bad decisions show up only many years later, when it is possibly too late to do anything to salvage the situation!
- * Observe different species of trees in your city or town. Remember to look at trees only a few decades old.

PLANTING AND CARE OF TREES

A good planting procedure would result in better survival of the seedlings. Here's how you can take care of your tree.

Keep the sapling well watered at all times, but do not immerse it in water or keep it waterlogged. Remove the pot, plastic cover or bag that the sapling was transported in.



Plant the tree sapling in a pit rather than on a mound. The pit should be about two feet (0.6 m) deep, two feet (0.6 m) square.

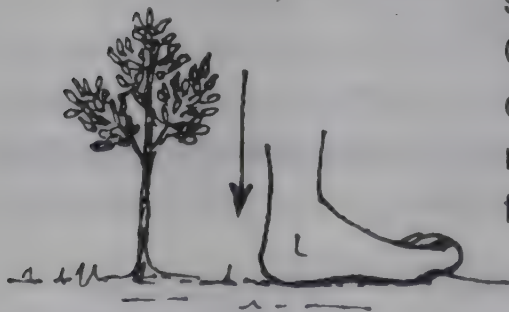
Plant it with the mud surrounding the roots. If any long roots are present, do not fold it back, but spread it out in the pit.

While filling the pit in which the new sapling has been placed, it is advisable to fill it with soil mixed with manure or coco-peat as this would increase water holding capacity, soil aeration and drainage.



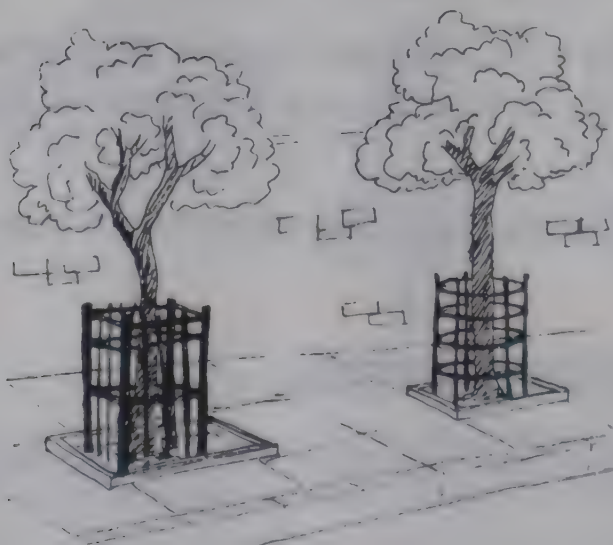
Application of fertilizers or compost (on proper horticultural advice) would enhance the nutrient levels by providing macronutrients and result in better plant growth. Manure could then provide the micronutrients.

After planting, the soil around the sapling should be pressed down so that all air pockets are removed. Cover the planting spot with loose soil or coco-peat to act as mulch. This would reduce water loss and prevent the soil from heating up under the midday sun.



Tree Guards

Tree Guards are very essential in our country as vandalism and damage from livestock are a major cause of mortality of young, newly planted saplings in our cities. Tree guards could be of various materials like wood, old tyre, ta drums, iron frames with grill or mesh, plastic netting, bamboo thatch or brick and mortar civil structure.



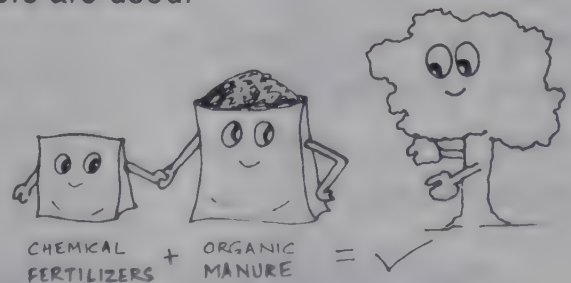
Manuring

With the gradual replacement of animal by mechanical transport, there has been an increasing difficulty in obtaining animal manure for field crops and garden flowers. Application of chemical fertilizers without organic manures in the soil is connected with serious consequences. The advantages of farmyard manure over chemical fertilizers springs its large humus content and its action on increasing soil fertility by stimulating the activity of soil microbes and in maintaining soil texture.

As vegetable matter is also able to add to the humus content of the soil, it stands to reason that segregated kitchen garbage along with leaf litter and garden sweepings can be used to make manure. Once composted (generally taking a period of 35 to 45 days of aerobic digestion), organic manures enrich the soil with nutrients and moisture when applied.

Some important tips on application of manures

- Choose the manure to suit the particular soil and the plant. Apply the right kind of manure at the proper time.
- Animal manures require care and management in storing. Never place them outdoors exposed to sun or rain. Cover them with a layer of earth to fix the escaping ammonia gas.
- Never use organic matter which is not fully decomposed as it has a burning effect on roots and destroys them.
- Chemical fertilizers should not be applied just before the rains as they would be washed away. Organic manures may be added to the soils before the rains.
- Do not use mixtures which interact with each other. For example, do not mix lime with manures rich in nitrogen and which part with it easily, for instance, lime with horse-dung; do not mix sodium nitrate with superphosphate.
- Water the plants well when chemical fertilizers are used.
- Organic manures cannot be dispensed with when commercial fertilisers are used. The latter should be used only to supplement and not to supplant organic manures.
- Do not freely manure newly planted plants and trees. Add manure to soil only after they have established themselves.



- Do not apply liquid manure to sickly plants. The best time to apply liquid manures to flowering plants is when the buds are forming; to a fruit tree after the fruits are set at intervals, and then they begin to colour; to vegetables during their active growing periods and to potted plants when the pots are full of roots.



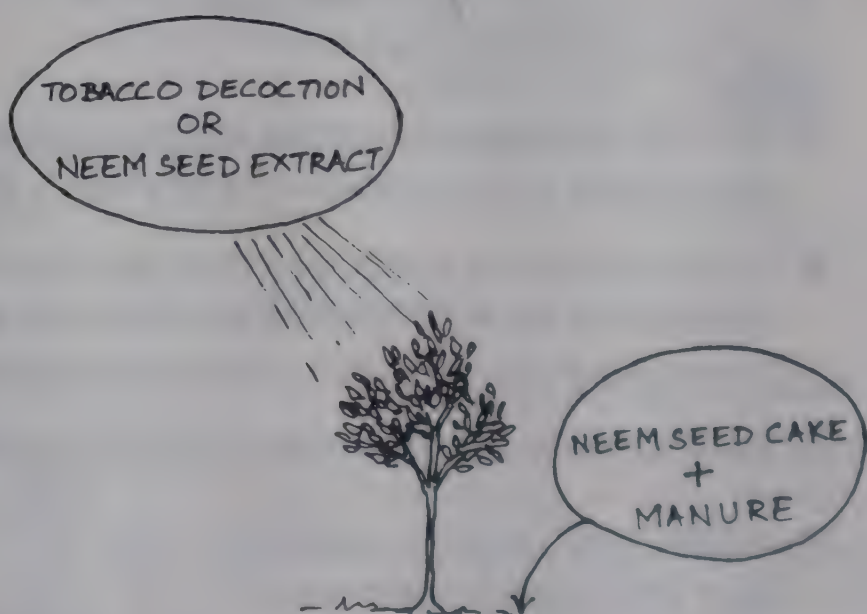
- The wrong way to manure a tree would be to apply manure very close to the stem. As feeding roots are away from the stem, apply the manure from 0.5 to 2.5 metres away from the stem, to the extent of the entire spread of the branches, as roots generally travel to that extent under the ground. The bigger the tree or shrub, the greater is the distance away from the stem the manure should to be applied for maximum benefit to the plant.

PEST MANAGEMENT

Innumerable diseases and pests attack plants, causing them injury of a greater or lesser magnitude. Most diseases are caused by microscopic bacteria, fungi, predating insects and viruses. For your garden, however, you could try the following two treatments before going in for chemical pesticides or insecticides.

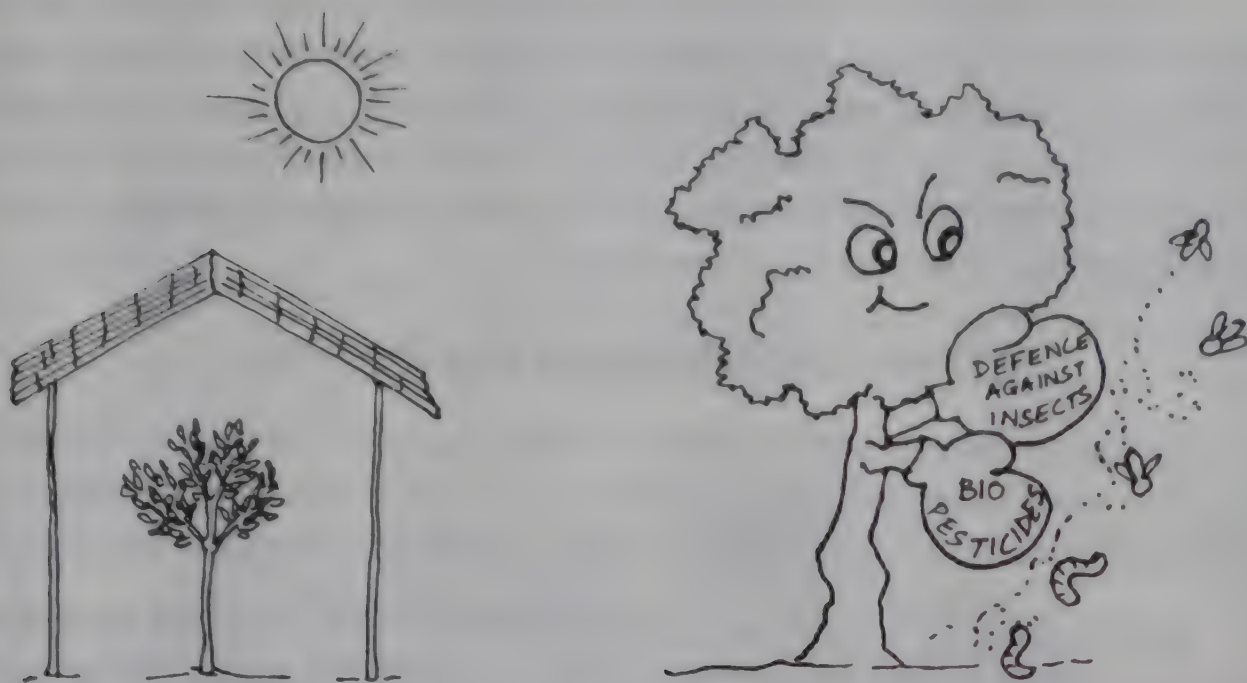
Tobacco Decoction:

Boil half a kg of tobacco stems and leaves in five litres of water for about half an hour. Alternatively, it may be steeped in cold water for a day or two. This is cooled, diluted with three or four times of water and sprayed upon plants infested with lice, mealy bugs and soft-bodied insects.



Neem Seed Extract: Crush hundred grams of fresh neem seeds in one litre of water. Soak for twenty-four hours. Squeeze out the juice from the seeds. The seed cake could be mixed with manure and used for the soil. This acts as a prophylactic agent for

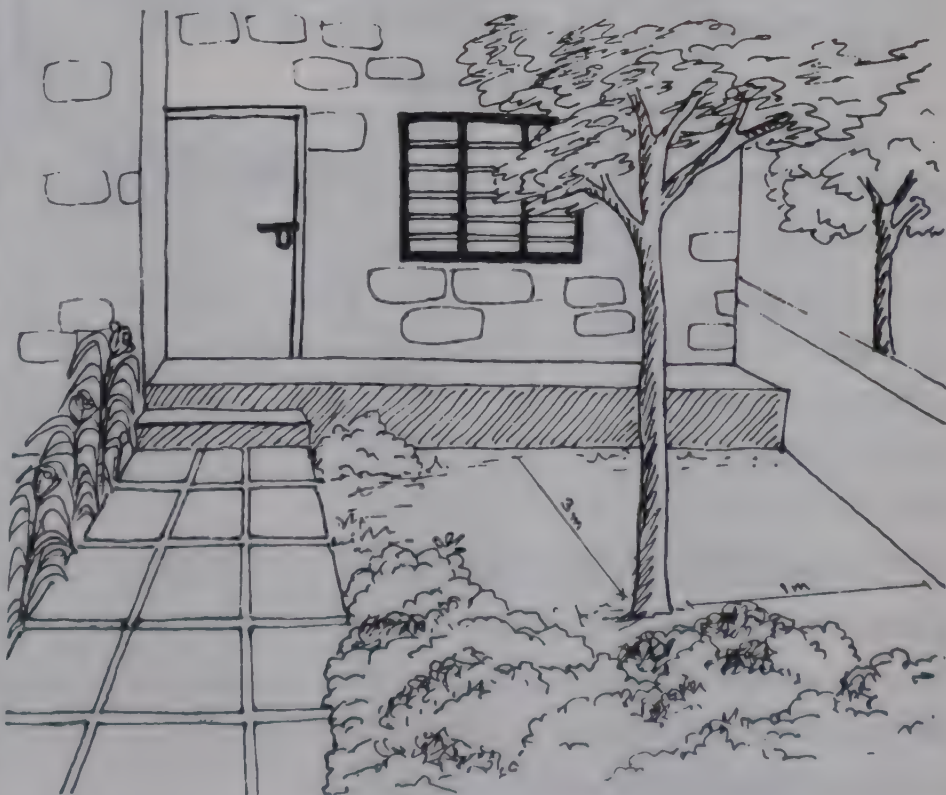
soil nematodes. Spray or sprinkle the neem seed extract on plants or around trees.



While Planting: Add Neem seed cake as manure and pesticide. When planting in the summer, remember to provide temporary shade for the plant.

SOME GENERAL CONSIDERATIONS

Most trees adapt to their surroundings. Just as we see a number of trees which are originally from other parts of the world growing in our country, so too have trees from India found homes in other parts of the world. Such trees that originate elsewhere, but adapt to situations in a different country are called Naturalized Trees. Trees should not therefore be discriminated against based on the land of their origin. Most naturalized trees support at least some local fauna and are a source of food when



the native species are in different phases of their annual cycle.

For those of us who are worried about roots getting beneath the buildings, we should remember that it is not wise to plant any shrub or tree too close to the wall. Also, a skirting is required for all walls and foundations. Soils near the foundations are usually drier than elsewhere. It is the alternate wetting and drying of soils beneath foundations that cause more damage than tree roots getting near them. A well-laid foundation should not have gaps that allow roots to grow into them.

ATTRACTING BIRDS AND BUTTERFLIES

Contrary to popular belief, we have a surprising assortment of small animals even in an urban area. Consequently, squirrels and many species of birds and butterflies could be attracted to your home and garden. All that they require is food, shelter and privacy.

Species like the Singapore Cherry and other species bearing small fruit, the various Erythrinas, Tabebuias and other brightly coloured nectar bearing flowers, attract many birds and squirrels in the appropriate season. Similarly, most of the scented and nectar bearing flowers attract butterflies. Many butterfly larvae feed on native plants.



Most birds and insects found in the garden depend on the different life forms in the garden for their food and shelter. Therefore all chemical pesticides and fertilizers need to be used with utmost care in small quantities and only when really necessary. The chemicals will otherwise get into the food chain of these organisms and cause physiological changes in their bodies and sometimes, even death.

TERRACE AND ROOFTOP GARDENS

We have till now talked about growing trees and plants in houses or institutions with open spaces and parks but open space may not be always available in urban area. Houses with lawns and backyards are giving way to multistoried buildings and housing complexes.

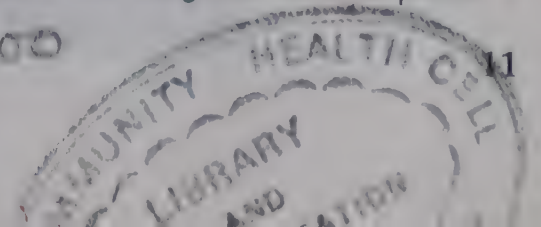


This has to a great extent reduced the greenery in our cities, as apartment complexes do not always offer us space to grow trees. Let us not despair at this but try and find solutions. We can use our balconies and terraces for growing shrubs, plants and creepers. Pots, old discarded buckets, drums, crates or even battery cases can be effectively used. Besides growing flowers and ornamental shrubs, vegetables too can be grown in our small terrace and rooftop gardens.

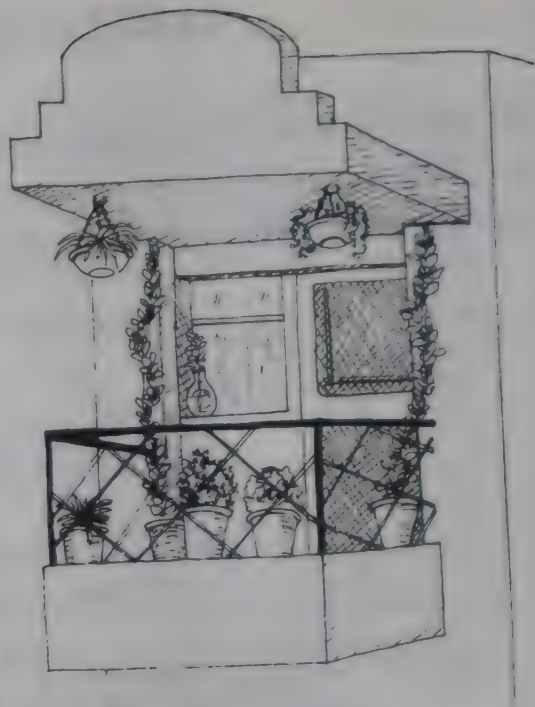
However for a good terrace/rooftop garden we must waterproof the place and have proper drainage systems. Care must be taken to waterproof the floor and surrounding walls of the balcony/roof with a good waterproofing compound. Tar is at times used to waterproof roofs but should be avoided in areas that are too hot in summers as it would melt. If we do not water proof the place although our plants may not suffer, it can cause some other difficulties. Seepage might occur in walls that can lead to dampness and promote growth of fungus on walls. The seepage might permeate to homes of people living below us and damage their walls and ceilings too and repairing them can prove to be quite expensive and bothersome.

Terraces and rooftops where we have our gardens must also have good drainage systems. We must ensure that water that is used for plants does not stagnate at one place. It

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must have a suitable outlet. Care also must be taken that the outlet never opens up in a place which proves to be inconvenient to our neighbours. For e.g. water outlet should never drain in a parking lot or sunshade of some other house. Drainage should also be of proper size with an iron mesh covering its outlet. This will prevent any leaves, soil or other litter getting washed away and blocking the drain. As a precaution we also must ensure leaves, soil and other litter do not collect at the outlet. To prevent soil being washed away from pots, keep them in small flat bottomed containers. If you have large number of pots keep them in wooden/metal shelf with tin sheets lining the bottom and sides.



Providing adequate shade on your terrace gardens is necessary for your plants. Some plants are extremely delicate and may wilt or dry up due to direct sunlight and need to be kept always in shade. Bamboo frames with creepers, corrugated tin sheets can be used for making shades. Place the plants in such a way that they are exposed to the morning sun. Sometimes plants may need to be shifted during the course of the day to expose them to adequate sunlight. This will depend upon the orientation and location of the house.

If handling soil is difficult, hydroponics can be tried out. Hydroponics is growing plants without soil.

Never place your potted plants on the parapet of the terrace or the roof as it can be quite unpleasant if it falls down.

Bauhinia purpurea

Purple Bauhinia



Two popular species of *Bauhinia* are *B. purpurea* and *B. variegata*, the former with fragrant flowers ranging from pink to purple and the latter, pale pink to white with some variegated petals. The hoof shaped leaves, like in all Bauhinias, are very characteristic of these species. Both are indigenous and are easily propagated from seeds. *B. purpurea* flowers while in leaf, while *B. variegata* loses most of its leaves while flowering. The trees bear long flat pods that are conspicuous.



Bixa orellana

The Arnotto



Bixa is a small evergreen tree producing pink flowers and bearing large, dark leaves. The seeds are borne in large attractive bunches and have spectacular scarlet seed capsules. The seed case is covered with long bristles. Red Annota dye is produced from the seeds. This species looks more like a large bush and is ideally suited for small gardens and lanes.



Bombax malabaricum

Red Silk Cotton

An upright tall, large, quick growing, deciduous tree with candelabra like branches, this species is a native of Burma, Sri Lanka and India. Called the Red Silk Cotton tree on account of the silky floss discharged by the fruit pods

that are used for stuffing pillows and cushions, its different parts also have medicinal value. In January-February, when the tree is quite leafless, it is striking, with large bright flowers clustered on its branches. The flowers, which are fleshy and edible, carpet the ground for nearly three weeks. The flowers attract a variety of birds. Large green fruits dangle from the tree, which turn brown releasing the cotton attached to the

seeds. The straight trunk may be used as a good support for training climbers. This tree is propagated from seeds. It is believed that in earlier days, the flowers of the red silk cotton were used for preparing colour for the Holi festival.



Brassia actinophylla

Umbrella Tree



A native of Australia, this medium, but erect tree, about 7 metres high, has very few branches. Its foliage is evergreen and consists of large radially divided leaves. The flowers are remarkable and are borne in brilliant scarlet or coral-red, terminally radiating spikes, measuring 30 to 60 cms in length. Often used as an ornamental plant when small, the tree improves, if pruned once in three years.



Butea monosperma (*Butea frondosa*)

Flame of the Forest



This undoubtedly is one of the most beautiful deciduous trees of India. A moderate sized deciduous forest tree of India, unattractive, when not in bloom, on account of its crooked and distorted stem.

After the flowering season, the tree bears broad leaves. Leaves are pinnately trifoliate and are stitched together to form plates used during religious functions. The tree is gorgeous in bloom, in February – March, when it is leafless, bearing in great profusion vivid orange-crimson flowers in large showy dense racemes. Economically, the tree is valuable; the lac insect thrives on its branches; the flowers produce a temporary dye; the tree provides the

Bengal Kino gum, which is largely used in tanning operations and in medicine. A variety of birds, resident and migratory, come to feed on the nectar.



Callistemon lanceolatus

Bottle Brush

Callistemon is derived from two words, meaning the beauty of the stamens. The stamens are brightly coloured, usually scarlet. It is a small erect growing tree native of Australia with a neat habit of growth. Foliage consists of narrow, stiff lanceolate aromatic leaves. It is very beautiful in April, with its bottlebrush like crowded cylindrical spikes of brilliant crimson-scarlet flowers with their free stamens, produced on old branches. The tree sometimes flowers in August-September also. It is suitable for planting in home gardens. Specialized nectar feeders like the sunbirds visit the blossoms regularly.



This tree is propagated from seeds that are very small.



Cassia fistula

Indian Laburnum

It is a very useful, medium-sized, beautiful tree with very slow growth. The tree is an imposing sight when in bloom in February or May, the whole tree being enveloped in a mass of large long, lax pendulous racemes of bright yellow flowers, which have a delicate fragrance. Flowers are succeeded by long cylindrical seedpods that turn black when ripe. The foliage consists of pinnate leaves and appear only after the flowering is over. The seeds and the bark of the tree are used in medicine and in dyeing. Propagated from seeds and also from suckers arising from the roots, the young plants are delicate and do not stand transplanting very well. One can observe the life cycle of a few butterflies on *C.fistula*.



Cassia javanica

Java Cassia

It has the most ornamental habit of growth among the cassias. The tree is medium sized, fast growing and tall, with branches that are long and wavy, arching gracefully downwards. The tree blooms in April-May and it seems as if the terminal leaflet of every compound leaf is transformed into a flower bunch. The bunches of rose-pink flowers seated erect on the branches with the foliage give the tree a really ornamental appearance, truly its own. During the peak season the ground under the tree is covered with the petals. Like most other Cassias it bears long, cylindrical, dark brown pods and can be propagated from seed.



Cassia siamea

Siamese Cassia



C. siamea is a medium sized hardy tree bearing terminal bunches of yellow flowers almost throughout the year, its seed-pods are flat and occur simultaneously with the flowers. Parakeets can be seen prising the seeds out of the pods. It is very easily propagated from seeds.



Cassia spectabilis

Spectacular Cassia



This *Cassia* species is very short lived. It is a short tree which branches at very low heights and hence may need pruning. The tree is a sight to behold during the flowering season when the canopy is covered with large inflorescence of yellow flowers. The tree starts flowering at a very early age. When the tree is not in flower, the reasonably dense canopy provides ample shade.



Cochlospermum gossypium

Yellow Silk Cotton

C. gossypium is a medium sized, indigenous, deciduous tree, with three or five lobed leaves. This tree is unattractive when not in bloom. But in the hot season, the tree presents a lovable sight with its bright, large, expanded, golden yellow flowers, which are produced in terminal clusters so profusely that the tree is literally clothed with a mass of yellow blooms. As the flowers fade, leaves appear. Five lobed capsular fruits that are as large as goose eggs and enclose cotton like fibers follow the flowers. This species should certainly be considered when planting trees in the dry areas, be it for roadside planting or for afforestation programmes. Since

the tree is narrow and tall, it can be planted in areas with limited space as well.



Colvillea racemosa

Colville's Glory



C. racemosa is an ornamental medium sized tree. This is a native of Madagascar and Mauritius, with foliage consisting of large twice-pinnate leaves with small linear leaflets resembling those of the Gulmohar. It bears in September, long, large, compact, drooping racemes, which are nearly 60 cms in length and are borne principally at the ends of the branches. The tree is very showy while in bloom with its large orange-red flowers, which resemble bunches of orchids. It is propagated from seeds.



Cordia sabastena

Scarlet Cordia



This species is a native of the West Indies. This dwarf evergreen tree with handsome foliage bear oval leaves which are large and rough and measure nearly 15 cms by 7 cms. Terminal clusters of very showy orange-scarlet flowers are produced in plenty during the rainy season and at other seasons as well. The flowers are succeeded by small white fruits. This tree is very easily propagated from seeds, which can be sown while quite fresh. The tree can be easily accommodated in small gardens.



Couroupita guianensis

Cannon Ball Tree

A native of tropical America it is commonly called the 'Cannon-Ball' tree on account of the large round fruits. This big erect tree is deciduous and sheds all its leaves in the course of a single week and is followed by the sprouting



of pleasing light green large leaves. The flowers are borne on long woody racemes, often measuring 10-12 cms in length that spring from the stem. The flowers are scented and are fleshy, large and possess a curious snake hood-like structure, made up of united stamens in the center of the flower. It is because of the united stamens that in Tamil it is called Nagalingam and Shivalinga in Kannada. The fruits are globular, brown, woody of an



astonishing size, almost the size of a human head! The tree can be propagated from seeds sown when fresh, or by suckers, which are produced in large numbers even at great distances from the tree.

Delonix regia

Gulmohur

A native of Madagascar it is well known as the Gulmohar or the 'Peacock Flower' tree. This tree has a spreading canopy and a fine feathery deciduous foliage of pinnate leaves with small leaflets. It is a quick growing tree which can be easily raised from seed. It has very handsome and striking flowers when in bloom, being enveloped in a mass of crimson scarlet or orange scarlet large flowers arranged in large erect panicles. The flowering season is between April and May. The tree is very valuable in the garden for shade. The pods are sword-like, 45 to 60 cms long, are at first green and then turn black and are suspended from the branches after the flowers wither away. The characteristic buttress roots help to anchor the tree which thrives even in dry climates.



Dolychandrone platycalyx

Yellow Dolly



This is a tall tree with broad and slightly serrated leaves. It bears yellow bell shaped flowers in small clusters even when in leaf. The pods of this tree are long, flat and twisted and hang from the almost leafless tree. These dehisce (break open) spilling the winged seeds which are propagated by wind.



Erythrina suberosa

Orange Coral Tree



It is a coarse tree bearing scarlet-red flowers and erect spines when the tree is entirely leafless between March and May. Mynas, white-eyes, bulbuls, orioles, warblers and other birds that feed on nectar are attracted to the flowers. Easily propagated by cuttings they are inserted in the soil for propagating the tree. It serves as a good support for climbers and grapevines. It can be propagated by vegetative means as well as through seeds.



Jacaranda mimosaefolia

Jacaranda



This is a deciduous, elegant tree that attains a height of about 8 metres. The foliage is pretty, with fine Mimosa-like feathery leaves, broken into small pinnae. Large erect showy panicles of bluish purple, bell shaped flowers are borne between March to May, when the tree has shed all its leaves. The mass of this light blue colour enveloping the tree is a characteristic sight from a distance. The seeds from the tree which can be propagated, are enclosed in round, woody capsules. They hang from the tree for a long time before dropping off.



Kigelia pinnata

Sausage Tree



It is a spreading, rather coarse looking, moderate sized shade tree, which is grown for the peculiar way in which the bunches of dull, purple colored, tubular flowers dangle from the different parts of the branches, at the end of rope like stalks, measuring upto 1 metre in length. The flowers are succeeded by enormous sausage shaped fruits of a dull brown colour. Each fruit measures 30 to 60 cms in length and 7 to 15 cms across. It is hardy and reasonably fast growing. The tree thrives anywhere, but prefers cool situations such as the banks of ponds. It is propagated from seeds.



Lagerstroemia flos-reginae

Queen's Flower

This tree is small, resembling a Guava tree, bearing very bright, rose-coloured sprays of flowers deserving the name 'Pride of India'. The flowers are borne from the ends of the branches in great profusion with each erect inflorescence being a foot long. The foliage soon appears with the flowers, so that the brightly coloured flowers standing erect well over the foliage give the tree an extremely fine ornamental appearance. The tree attains majestic proportions in well-watered areas, particularly on river and streambeds. Away from water the growth is stunted making it quite suitable for planting in gardens, parks and roadsides. The leaves are shed,



few at a time and turn red or yellow prior to dropping off. It is easily raised from seeds.



Milletia ovalifolia

Moulmein Rosewood



The Moulmein Rosewood is often planted as an avenue tree. It is well suited even for home gardens and parks. It is very attractive when in bloom, completely laden with mauve coloured flowers in drooping clusters. The flowers are very similar to that of Pongam (Apart from this similarity, the two species are very different). The tree is leafless during the flowering season. The leaves are borne on drooping branchlets and are small. The seedpods are flat and contain two to three seeds.



Millingtonia hortensis

Indian Cork Tree



A tall, stately, rapid growing tree which is brittle and can be damaged by strong winds. It has densely packed foliage of bright green polished leaves. The fragrant white flowers, pollinated by nocturnal insects are trumpet shaped, 7 to 9 cms long, and borne profusely in June and November. They form a carpet on the ground during the two flowering seasons. The bark has deep fissures and is used as cork and hence the common name.



Muntingia calabura

Singapore Cherry



This is a medium-sized tree, growing to a height of 5 to 7 metres having a spreading canopy making it useful for shade. It has a regular outline bearing small, white flowers and small red berries that are used in making jams and tarts. The berries attract many frugivorous birds like flower-peckers and bulbuls.



Peltophorum pterocarpum

Copper Pod



The name 'Copper Pod' comes from the coppery-red seed cases that are seen profusely on the tree turning blackish with age. This tree can be easily raised from seed. This tree is fast growing, hardy and can survive in harsh conditions. The Copper Pod is a pretty sight when in bloom bearing clusters of yellow flowers at the end of the branches, together with dark green leaves. The ground under the tree is strewn with a carpet of the yellow petals. The tree is large and has an excellent shape and structure.



Plumeria sps.

Temple Tree or Pagoda Tree

Commonly known as the 'Temple tree' or 'Pagoda tree', it is planted in temples and in Buddhist shrines in India. This genus has trees with stout and milky stems and large deciduous leaves in most of the species. Its



flowers are fragrant, large and waxy and produced in great profusion, clustered in terminal cymes. All the species can be easily propagated from cuttings. Plumerias can thrive well in dry, rocky conditions or soils, resist sea breeze, and do not break or shatter during a hurricane or cyclonic winds. The other most important virtue is its intoxicating fragrance. The huge clusters which are sometimes more than two-thirds

of a metre across are composed of soft, often velvety or satiny blossoms, which range in colour from deep burgundy red to combinations of pink, yellow, red and white.



Pongamia glabra

Pongam



This is a partially deciduous, medium sized useful tree with shining dark green leaves, bearing pendant racemes of lilac flowers. The colour of the flowers varies from white to pale purple. At certain times of the year it attracts many butterflies like the Cerulean, Blue Tiger and Common Crow. A useful oil is extracted from the seeds and the oil-cake is used extensively as manure. The leaves of this tree make excellent green manure. The trees may be planted closely and pruned to form a tall hedge.



Samania saman

Rain Tree

This large tree has an impressive umbrella-like canopy with white and pink flowers resembling an open brush contrasting against the green crown. It can be quite fascinating to watch the tree



do its daily exercise of opening and closing its leaves. An ideal species to be planted along broad roads, it also provides for roosting and nesting of many birds. It is propagated by cuttings or by seed. The origin of the common name of this species is uncertain, though it is believed that liquorice like droplets keep dropping if you stand under it. Though

originally from South America, it survives in Indian conditions.



Saraca indica

Ashoka

An indigenous, evergreen, slow-growing, small tree, held sacred since it was under this tree in Lanka that Sita was kept captive by Ravana. The young leaves are clustered and drooping as in



Brownea and Amhersia. Ashoka is very much part of Indian mythology and also used in traditional forms of medicine. On the stems and branches are borne the flowers, which are slightly scented, in dense round erect panicles, 7 to 15 cms in diameter, changing colour from yellowish orange to orange scarlet. The flush of bloom is from February to May, but the tree bears flowers intermittently throughout the year. It prefers a semi

shady and sheltered situation.

This tree can be easily propagated from seeds.



Solanum grandiflorum

Potato Tree

A tall tree, it grows quickly to a height of 5 metres with evergreen foliage and a graceful spreading growth habit. The branches are herbaceous and armed with spines. The leaves are large, 20 to 30 cms long, 12 to 15 cms

broad and are nicely lobed. They are rough, covered with woolly hair, both on the upper and on the under side and they have three or four spines on the midrib on the underside. The tree is perpetually in bloom. The flowers are arranged in clusters showing themselves well above the foliage. They are about 3 cms across and resemble the flowers of a potato. The corolla is five-lobed and is of a bluish mauve colour, which bleaches

to almost white. The fruits are as big as billiard's balls. Propagated from cuttings or seeds, it is a handsome tree suited for small gardens. It can be placed with large shrubs in the shrubbery.



Spathodea campanulata

Tulip Tree



Commonly called 'The Flame' or the 'Tulip tree' or the 'Fountain Tree', it is a soft-wooded, tall, erect, deciduous tree, grown both for its shade and for its ornamental appearance. It is a striking tree of choice for

avenues and probably too big for private gardens. The leaves are glossy and bright green; they fall off for a few weeks and new ones appear with the blooms. Large cymes of bright orange-scarlet flowers are produced at the tips of the branches throughout the wet season giving the tree a charming and conspicuous look from a distance. Many birds drink nectar from its flowers. It is not unusual to find buds of various ages, flowers,

and erect, green seed cases in the same cluster. Children use the buds as squirt guns. The seed cases when mature become brown and woody from which a large number of tiny brown seeds surrounded by a transparent, polythene-like appendage are dispersed in large quantities.



Tabebuia argentic

Tree of Gold



Rightly known as the Tree of Gold, it is covered with immense bunches of dazzling yellow flowers often when it is in the leafless condition at the beginning of summer. A lasting memory when used as a specimen alone against the sky or grouped together against a background of taller Tabebuias. Small to medium growth and silvery blue leaves further distinguish this excellent tree. Its other virtues are its beautiful corky bark and excellent shape. It is an interesting bonsai subject as well.



Tabebuia avellanidae

Pink Tabebuia

Flowers of deep rose-lavender adorn the tree when it is leafless, their trumpet like corolla glowing in the sun. This is a rich royal specimen of medium height with a fine and even branching structure.



Its winter flowering character makes it the most desirable choice for planting, as very few tropical trees flower in winter. This species has very characteristic broad leaflets, which are five in number, curving inward and pointed at the tip. Another species, *T. rosea* bears large trumpet shaped flowers in clusters similar to the other Tabebuias. The colour of the flower varies from rose to white. Dark green polished, oily leaves and sturdy branching structure add to its towering form and grandeur.



Table 1: Trees with attractive flowers borne when the tree has few or no leaves

Species	Common Name	Size	Flowering months												Flower colour	Leaf/ leaflets
Tabebuia avellanedae	Pink Tabebuia	Small	-	-	-	-	-	-	-	-	-	-	-	-	Mauve	Large
Plumeria acutifolia/ rubra	Temple tree/ Pagoda tree	Small	-	-	-	a	m	j	j	a	s	-	-	-	Red/ White Scented	Large
Erythrina suberosa	Red coral tree	Small	-	-	-	m	a	-	-	-	-	-	-	-	Red	Large
Erythrina indica	Indian Coral tree	Small	-	f	m	-	-	-	-	-	-	-	-	-	Red	Large
Gilicidia maculata	Madre Tree of South America	Small	-	f	m	a	-	-	-	-	-	-	-	-	Red	Large
Cochlospermum gossypium	Yellow Silk Cotton tree	Small	-	f	m	a	-	-	-	-	-	-	-	-	Yellow	Large
Tabebuia argentea	Tree of Gold	Small	j	f	m	-	-	-	-	-	-	-	-	-	Yellow	Large
Milletia ovalifolia	Moulmein Rosewood	Small	-	-	m	a	-	-	-	-	-	-	-	-	Lilac	Medium
Cassia javanica	Java Cassia	Medium	-	-	-	-	a	m	-	-	-	-	-	-	pink and White	Small
Delonix regia	Gulmohar	Medium	-	-	m	a	m	j	-	-	-	-	-	-	Red	Small
Cassia fistula	Indian Laburnum or the Golden shower	Medium	-	f	m	-	-	-	-	-	-	-	-	-	Yellow	Large
Jacaranda mimosaeifolia	Jacaranda	Medium	-	f	m	-	-	-	-	-	-	-	-	-	Blue	
Butea frondosa	Flame of the Forest	Medium	-	f	m	-	-	-	-	-	-	-	-	-	Orange	Large
Tabebuia spectabilis	Spectacular Tabebuia	Small	j	f	m	-	-	-	-	-	-	-	-	-	Golden yellow	Large
Bombax malabaricum	Silk Cotton tree	Large	j	f	m	-	-	-	-	-	-	-	-	-	Red	Large

Tree size

Large : 9 m crown dia
Medium : 6 m crown dia
Small : 3 m crown dia

Leaf/ Leaflet size

Large : > 7 cm
Medium : 3 - 7 cm
Small : < 3 cm dia

Table 2: Trees with attractive flowers borne when in leaf

Species	Common Name	Size	Flowering months										Flower colour	Leaf/ leaflets
<i>Cordia sabastena</i>	Scarlet Cordia	Small	-	-	-	-	-	-	-	-	-	-	Orange	Large
<i>Bauhinia pupurea</i>	Camel-foot tree	Small	-	-	-	-	-	-	-	-	-	-	Pink to Purple	Medium
<i>Nyctanthus arborescens</i>	Parijata	Small	-	-	-	-	-	-	-	-	-	-	White, Scented	Small
<i>Holarrhena antidysenterica</i>	The Easter Tree	Small	-	-	-	-	-	-	-	-	-	-	White	Large
<i>Dillenia indica</i>		Small	-	-	-	-	-	-	-	-	-	-	White	Large
<i>Cassia marginata/ roxburghii</i>	Red Cassia	Small	-	-	-	-	-	-	-	-	-	-	Red	Small
<i>Bauhinia racemosa</i>	Bauhinia	Small	-	-	-	-	-	-	-	-	-	-	White	Medium
<i>Melia azedarach</i>	Persian Lilac/ The Bead tree	Small	-	-	-	-	-	-	-	-	-	-	Lilac	Small
<i>Plumeria obtusa/ alba</i>	Temple tree	Small	-	-	-	-	-	-	-	-	-	-	Yellow/ White	Large
<i>Brassia actinophylla</i>	Umbrella tree	Small	-	-	-	-	-	-	-	-	-	-	Red	Large
<i>Wrightia tinctoria</i>	Ivory Wood tree	Small	-	-	-	-	-	-	-	-	-	-	White	Medium
<i>Sesbania grandiflora</i>		Small	-	-	-	-	-	-	-	-	-	-	Pink	Medium
<i>Muntingia calabura</i>	Singapore Cherry Tree	Small	-	-	-	-	-	-	-	-	-	-	White	Medium
<i>Bauhinia variegata</i>	The Orchid tree	Small	-	-	-	-	-	-	-	-	-	-	Pale pink	Small
<i>Callistemon lanceolatus</i>	Bottle-brush	Small	-	-	-	-	-	-	-	-	-	-	Red	Large
<i>Saraca indica</i>	Ashoka tree	Small	-	-	-	-	-	-	-	-	-	-	Red	Medium
<i>Bauhinia tomentosa</i>	Bauhinia	Small	-	-	-	-	-	-	-	-	-	-	Yellow	Medium
<i>Amherstia nobilis</i>	Queen of flowering trees	Small	-	-	-	-	-	-	-	-	-	-	Orange	Large
<i>Solanum macranthum/ grandiflorum</i>	Potato tree	Small	-	-	-	-	-	-	-	-	-	-	Purple	Large
<i>Cassia siamea</i>	Siam Cassia	Small	-	-	-	-	-	-	-	-	-	-	Yellow	Small
<i>Cassia spectabilis</i>	Spectacular Cassia	Medium	-	-	-	-	-	-	-	-	-	-	Yellow	Small
<i>Colvillea racemosa</i>	Colville's Glory	Medium	-	-	-	-	-	-	-	-	-	-	Orange to Yellow	Small
<i>Tectona grandis</i>	Teak tree	Medium	-	-	-	-	-	-	-	-	-	-	Pale yellow	Large

Tree size

Large

Medium

Small

: 9 m crown dia

: 6 m crown dia

: 3 m crown dia

Leaf/Leaflet size

Large

Medium

Small

: > 7 cm

: 3 - 7 cm

: < 3 cm dia

Table 2: Trees with attractive flowers borne when in leaf (contd.)

Adansonia digitata	Baobab tree	Medium	-	-	-	-	-	-	-	-	-	-	-	White	Small
Millingtonia hortensis	Indian Cork Tree	Medium	-	-	-	-	-	-	-	-	-	n	-	White, Scented	Large
Calophyllum inophyllum	Alexandrian Laurel	Medium												White	Small
Memecylon umbellatum		Medium	-	m	a	m	-	-	-	-	-	-	-	Blue	Large
Lagerstroemia speciosa	Pride of India	Medium	-	m	a	m	-	-	-	-	-	-	-	Pink / Mauve	Small
Anthocephalus cadamba	Kadamba	Medium	-	m	a	m	-	-	-	-	-	-	-	Yellow	Medium
Tabebuia rosea	Rose Tabebuia	Medium	-	f	m	-	-	-	-	-	-	-	-	Pink	Medium
Cassia grandis	Horse Cassia of Pink Shower	Medium	-	f	m	-	-	-	-	-	-	-	-	Pink	Medium
Eugenia jambolana	Jamoon Tree	Medium	-	f	m	a	m	-	-	-	-	-	-	Pink	Small
Dolychandrone platycalyx	Yellow Dolly	Medium	-	-	-	-	m	j	-	-	-	-	-	Yellow	
Acacia auriculiformis	Phyllode acacia	Medium	j	-	-	-	-	-	-	-	-	-	d	Yellow	Medium
Barringtonia acutangula		Medium	j	f	m	-	-	-	-	-	-	-	-	Red	Large
Thespesia populnea	Portia tree	Medium	j	f	m	a	m	j	j	a	s	o	n	Yellow, Red	Large
Barringtonia racemosa		Medium	j	f	m	a	m	j	j	a	s	o	n	White	Large
Parkia biglandulasa	Badminton ball Tree	Large	-	-	-	-	-	-	-	-	-	o	n	Yellow	Small
Michelia champaca	Champaka	Large	-	-	-	a	m	-	j	a	s	-	-	Yellow, Scented	Large
Mimusops elengi	Elengi	Large	-	-	m	a	-	-	-	-	-	-	-	White, Scented	Small
Alstonia scholaris	Devil's Tree	Large	-	-	m	a	-	-	-	-	-	o	n	White	Large
Pongamia glabra	Karanj or Pongam	Medium	-	-	m	a	m	-	-	-	-	-	-	Lilac	Medium
Kigelia pinnata	Sausage Tree	Large	-	-	m	a	m	j	-	-	-	-	-	Maroon	Medium
Peltophorum pterocarpum	Copperpod Tree	Large	-	-	m	a	m	j	j	a	s	-	-	Yellow	Small
Samanea saman	Rain Tree	Large	-	-	m	a	m	j	j	a	s	-	-	Pink	Small
Spathodea campanulata	Tulip Tree	Large	j	f	m	a	-	-	-	-	-	s	o	Orange	Medium
Couroupita guianensis	Cannon Ball Tree	Large	j	f	m	a	m	j	j	a	s	o	n	White, Yellow, Pink	Medium

Tree size

Large

Medium

Small

: 9 m crown dia

: 6 m crown dia

: 3 m crown dia

Leaf/Leaflet size

Large

Medium

Small

: > 7 cm

: 3 - 7 cm

: < 3 cm dia

Table 3: Shade Trees (flowers not conspicuous)

Species	Common Name	Size	Feature	Leaf/ leaflets
Adenanthera pavonina	Bead Tree	Large	Quick growing, evergreen	Bipinnate
Azadirachta indica	Neem	Medium	Evergreen	Dense leaflets
Dalbergia sissoo	Shisham	Medium	Grows rapidly, ideal for roadsides	
Enterolobium cyclocarpum	Monkey ear pod	Large	Excellent shade tree	Feathery
Ficus benjamina	Java Fig Tree	Large	Slow growing, tall, evergreen	Small leaves
Ficus glomerata	Indian Fig Tree	Medium	Ornamental, attracts birds	Large
Ficus mysorensis	Mysore banyan Tree	Large	Ornamental avenue and shade tree	Large
Pongamia glabra	Indian Beech	Medium	Partially deciduous	
Madhuca indica	Mahua	Medium	Shade tree	
Tamarindus indicus	Tamarind	Large	Shade tree	Small
Mangifera indica	Mango	Large	Shade tree	Small
Terminalia arjuna	Arjun	Large	Shade tree	Small

Tree size

Large : 9 m crown dia
Medium : 6 m crown dia
Small : 3 m crown dia

Leaf/Leaflet size

Large : >7 cm
Medium : 3 - 7 cm
Small : < 3 cm dia

Table 4: Useful trees ideal to be grown in slum or other congested urban areas

Species	Common Name	Size	Utility	Nutrients
Psidium guava	Guava	Small	Fruit	Rich source of Vitamin C
Averrhoa bilimbi	Bilimbi	Small	Fruit	Rich source of Vitamin C
Carica papaya	Papaya	Small	Fruit and leaves	Rich in Vitamins A & C
Citrus aurantifolia	Lime	Small	Fruits and leaves	Rich source of Vitamin C
Musa sapientum	Banana	Small	Fruit and all parts	Rich source of Vitamin C and Iron
Murraya koenigii	Curry leaves	Small	Leaves and branches	Rich in Vitamin A
Moringa pterygosperma	Drumstick	Small	Fruits and Leaves	Rich in Iron, Vitamin A and E & Calcium

Table 5: Common Shrubs and herbs

Species	Common Name	Size	Flowering months												Flower colour	Colour of Leaf/ leaflets
Tecomaria capensis	Honey suckle	Small	-	-	-	-	-	-	-	-	-	-	-	-	Orange/ Scarlet	-
Buddleia lindleyana	Butterfly bush	Small	-	f	m	a	-	-	-	-	-	-	-	-	Blue, white & pink	-
Hamelia patens	Hamelia	Medium	j	f	m	a	m	j	a	s	o	n	d	-	Orange	-
Cassia alata	Cassia		j	f	-	-	-	-	-	-	o	n	d	-	Yellow	-
Mussaenda	Mussaenda		-	-	m	a	m	j	a	-	-	-	-	-	Pale yellow/ orange red	-
Pentas lanceolata	Pentas cornea		j	f	m	a	m	j	a	s	o	n	d	-	White, pink, orange & red	-
Phyllanthus rosea	Phyllanthus													-		Pink
Duranta macrophylla/ repens	-														Blue	Green
Duranta goldiana	-															Golden yellow
Lagestroemia digutrum	-														White	-
Euphorbia careasana	Euphorbia														-	Bronze
Poinsettia	Poinsettia		j	-	-	-	-	-	-	-	-	n	d	-	-	Brilliant red
Codium	Crotons													-	-	Variously coloured
Caesalpinia pulcherima	Peacock flower	Large	j	f	m	a	m	j	a	s	o	n	d	-	Bright yellow or orange red	-
Hibiscus	Hibiscus	Large	j	f	m	a	m	j	a	s	o	n	d	-	Variously coloured	Green
Holmskoldia sanguinea	Holmskoldia	Medium	-	-	-	-	-	-	-	-	o	n	-	-		
Acalypha wilkesiana	Acalypha															
Caliandra haemacephala	Caliandra	Medium	j	f	m	a	m	j	a	s	o	n	d	-	Crimson pink	-
Nerium odorum	Oleander	Large	j	f	m	a	m	j	a	s	o	n	d	-	White- pale pink	Green
Russelia equisetiformis	Russelia coral plant		j	f	m	a	m	j	a	s	o	n	d	-	Corel Red	-
Allemanda	Allemanda		j	f	m	a	m	j	a	s	o	n	d	-	Yellow/Purple	
Boungainvillea	Boungainvillea		j	f	m	a	m	j	a	s	o	n	d	-	Variously coloured	Green or Variegated

Large

Medium

Small

: 1.8 – 2.4 m

: 1.2 – 1.8 m

: 0.6 – 1.2 m

* Are all trailers and could reach various heights based on maintenance

Table 5 (contd.) Rockery plants

Species	Common Name	Size	Flowering months												Flower colour	Leaf/ leaflets
<i>Furcreaea wastsoniana</i>	Furcreaea	Small														Variegated leaves
<i>Sansevieria laurentii</i>	Sansevieria	Small														Creamy yellow
<i>Cuphea platycentra</i>	Cuphea	Small	j	f	m	a	m	j	j	a	s	o	n	d		Scarlet or pink
<i>Asparagus officinalis</i>	Asparagus	Small														Green
<i>Euphorbia splendens</i>	Euphorbia	Small														Scarlet
<i>Malpighia coccigera</i>	Malpighia	Small	j	f	m	a	m	j	j	a	s	o	n	d		-
<i>Verbena erinoides</i>	Verbena	Small	j	f	m	a	m	j	j	a	s	o	n	d		-
<i>Vinca rosea</i>	Vinca	Small	j	f	m	a	m	j	j	a	s	o	n	d	Pink/ white	-
<i>Zephyranthus</i>	Zephyranthes	Small	j	f	m	a	m	j	j	a	s	o	n	d		-
<i>Alternanthera versicolor</i>	Alternanthera	Small														Variegated leaves

* Are all trailers and could reach various heights based on maintenance

Large : 1.8 – 2.4 m
Medium : 1.2 – 1.8 m
Small : 0.6 – 1.2 m

Table 5 (contd.) Climbers

Species	Common Name	Size	Flowering months												Flower colour	Colour of Leaf/ leaflets
Ipomea species	Ipomea	-	j	f	m	a	m	j	j	a	s	o	n	d	Red/ Blue/ Yellow/ Purple	-
Bignonia venusta	Golden shower	-	j	f	-	-	-	-	-	a	s	-	-	-	Golden orange	-
Allamanda grandiflora	Allamanda	-	j	f	m	a	m	j	j	a	s	o	n	d	Light yellow	-
Antigonon leptopus	Antigonon	-	j	f	m	a	m	j	j	a	s	o	n	d	Rose	-
Thunbergia mysorensis		-													Orange/ yellow	-

Large

Medium

Small

: 1.8 – 2.4 m

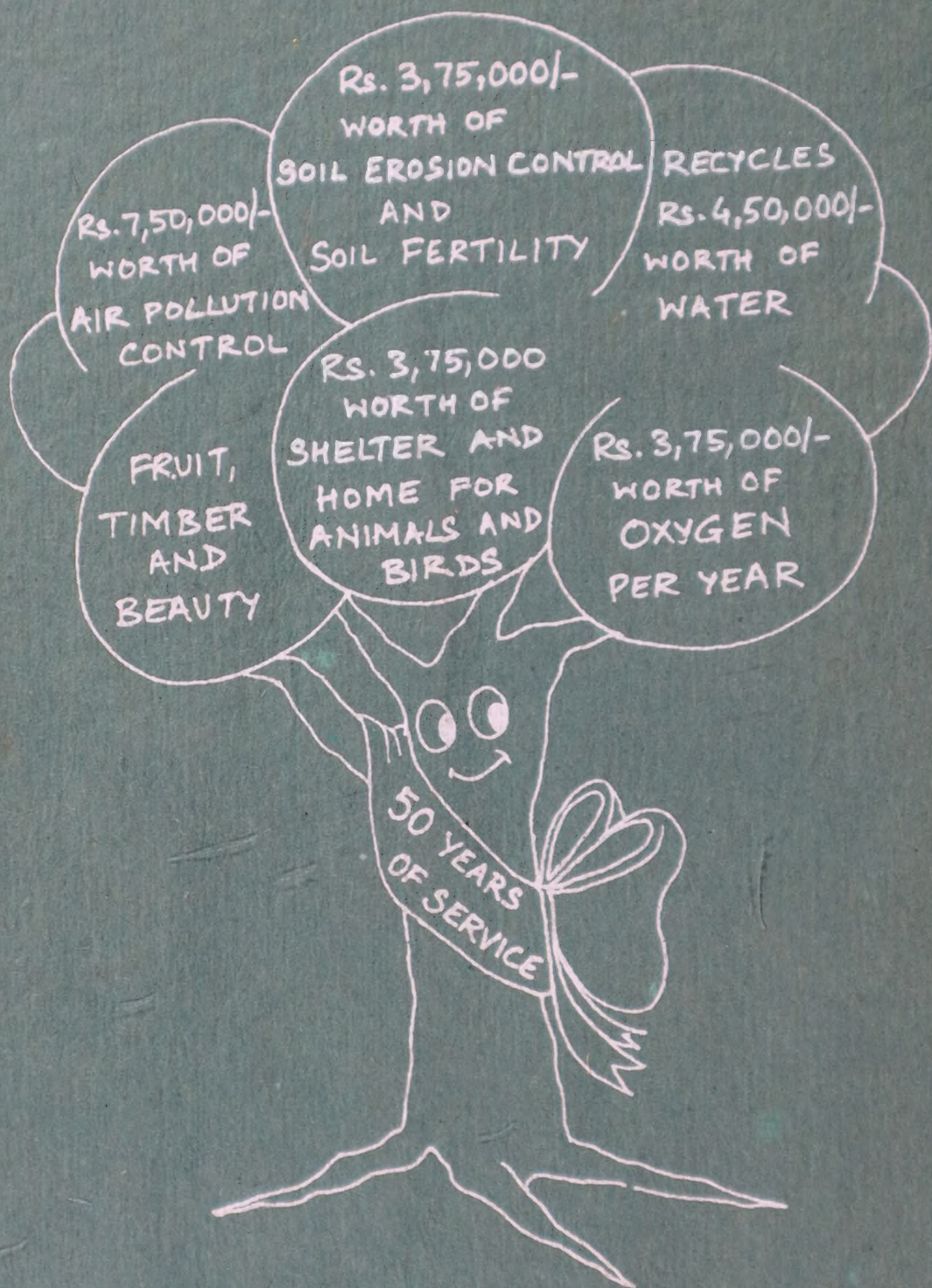
: 1.2 – 1.8 m

: 0.6 – 1.2 m

* Are all trailers and could reach various heights based on maintenance

REFERENCES AND FURTHER READING

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The contribution or value of a tree to the environment has been calculated in a scientific study at the University of Calcutta. It has been found that a tree with a life span of about 50 years generates Rs.3,75,000 worth of oxygen per year. It recycles Rs.4,50,000/- worth of water and provides Rs.3,75,000/- worth of Soil Erosion Control and Soil Fertility. It also provides Rs.7,50,000/- worth of air pollution control and provides Rs. 3,75,000/- worth of shelter and home for animals and birds. These figures do not include the value of the fruit, timber and beauty the tree provides in its lifetime.